Association between coarse particles air pollution and hospital admissions for respiratory and cardiovascular diseases in Busan, Korea

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Background and Aims: Research on the health effects of coarse particles, greater than 2.5 μm and 10 μm or less in diameter ($PM_{10-2.5}$) is limited and findings have been mixed. The chemical composition of particulate matter differs by size with more crustal materials in $PM_{10-2.5}$ and more combustion related constituents in $PM_{2.5}$. This study aims to estimate risk of hospital admissions for respiratory and cardiovascular diseases associated with $PM_{10-2.5}$ and $PM_{2.5}$ exposure.

Methods: A dataset was collected from for Busan in Korea, which had daily hospital admission rate for respiratory and cardiovascular disease, meteorological variables (temperature, humidity and air pressure), and $PM_{10-2.5}$ and $PM_{2.5}$ concentrations for the periods 2005–2006. We employed a time-stratified case-crossover design.

Result: There were a total of 126,083 and 137,839 inpatient admissions for respiratory and cardiovascular diseases, respectively. During the study period a 10 $\mu m/m^3$ increase in $PM_{10-2.5}$ and $PM_{2.5}$ were also associated with increase in respiratory disease admissions by 2.91% (95% CI: 2 to3.82) and 0.96% (0.35 to 1.58), respectively. However, when mutually adjusted, the association of $PM_{10-2.5}$ and $PM_{2.5}$ with respiratory disease admission were 0.08% (-0.24 to 0.39) and 0.77% (0.3 to 1.25) for exposure on the previous day of hospital admission, respectively.

Conclusions: After adjusted by $PM_{2.5}$, there was no statistically significant association between coarse particulates and hospital admissions for respiratory and cardiovascular diseases.

References:

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